

Computer Science Department  
University of Victoria  
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## Research Interests

My area of research is Software Engineering with a focus on the design and development of architectures and infrastructures for self-adaptive software systems. My research interests include software engineering, self-adaptive systems, models at run-time and domain specific languages. I am currently working towards automated software evolution of cloud software applications through quality-driven continuous experimentation.

## Education

2016-Present **Ph.D. Candidate in Computer Science** - University of Victoria, Canada

GPA 3.85/4

Advised by Drs. Hausi Müller and Gabriel Tamura

*Thesis topic: Continuous software evolution at run-time*

2014-2016 **M.Sc. in Software Engineering** - Universidad Icesi, Colombia

GPA 3.87/4

Advised by Dr. Gabriel Tamura

*Thesis: [A framework for generating and deploying dynamic performance monitors for self-adaptive software systems](#)*

2009-2014 **B.E. in Systems Engineering** - Universidad Icesi, Colombia

GPA 3.21/4 • Engineering Dean's list in semesters VI, VII, VIII and IX

Advised by Angela Villota-Gomez and Dr. Gabriel Tamura

*Degree project: [PaSCAni: A language for run-time V&V of functional requirements](#) (Spanish)*

## Awards and Honors

- 2019 🏆 **Winner of the DITA Hackathon**, IBM Canada and York University
- 2019 🏆 **Best Poster Presentation**, SEMLA and CSER joint poster session
- 2018, 2019 **Travel Scholarship**, CRA-URMD Grad Cohort
- 2017-2019 **UVic Graduate Award**, University of Victoria
- 2017 **Howard E. Petch Research Scholarship**, University of Victoria
- 2017-2019 **IBM Advanced Studies Grant**, IBM
- 2017 🏆 **Cleanest Code at HackUVic**, Development Club at the U. of Victoria (judged by local companies)
- 2016 **Doctoral Fellowship (full tuition scholarship)**, University of Victoria
- 2014 **Master's Degree Fellowship (full tuition scholarship)**, Universidad Icesi
- 2014-2016 **Young Researcher Fellowship**, Colombian Department of Science, Technology, and Innovation
- 2014 **Student Loan Waiver**, Colombian Institute of Educational Credit and Technical Studies
- 2013 **Top ECAES Exam**, Colombian Institute for the Promotion of Higher Education
- 2009 **Bachelor's Degree Scholarship (25% tuition)**, Universidad Icesi
- 2011-2014 **Engineering Dean's list in semesters VI, VII, VIII, & IX**, Universidad Icesi

<sup>1</sup>This curriculum vitae was last updated on August 21, 2019. Download the latest version from [migueljimenez.co/cv.pdf](https://migueljimenez.co/cv.pdf)

## Publications

### Refereed Journal Articles

- [J.1] Hugo Arboleda, Andrés Paz, **Miguel Jiménez**, and Gabriel Tamura. “[Development and Instrumentation of a Framework for the Generation and Management of Self-Adaptive Enterprise Applications](#)”. en. In: *Ingeniería y Universidad* 20 (Dec. 2016), pp. 303–333. *Rank: Q3 SJR: 0.161*.

### Refereed Conference Proceedings

- [C.1] Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, **Miguel Jiménez**, and Hausi A. Müller. “[UML-driven Automated Software Deployment](#)”. In: *Proceedings of the 28th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2018, pp. 257–268. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.2] Prashanti Angara, **Miguel Jiménez**, Kirti Agarwal, Harshit Jain, Roshni Jain, Ulrike Stege, Sudhakar Ganti, Hausi A. Müller, and Joanna W. Ng. “[Foodie Fooderson a Conversational Agent for the Smart Kitchen](#)”. In: *Proceedings of the 27th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2017, pp. 247–253. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.3] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, and Hausi A. Müller. “[Deployment Specification Challenges in the Context of Large Scale Systems](#)”. In: *Proceedings of the 27th Annual International Conference on Computer Science and Software Engineering (CASCON)*. IBM, 2017, pp. 220–226. *Rank: B1 (Qualis) Acceptance rate: 27%*.
- [C.4] Hugo Arboleda, Andrés Paz, **Miguel Jiménez**, and Gabriel Tamura. “[A framework for the generation and management of self-adaptive enterprise applications](#)”. In: *2015 10th Computing Colombian Conference (10CCC)*. 2015, pp. 55–62. *SJR: 0.114*.

### Refereed Workshop Proceedings

- [W.1] Jean-Michel Bruel and **Miguel Jiménez**. “[DevOps’18 Education Panel](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 221–226.
- [W.2] **Miguel Jiménez**, Lorena Castaneda, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Joe Wigglesworth. “[DevOps Round-Trip Engineering: Traceability from Dev to Ops and Back Again](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 73–88.
- [W.3] **Miguel Jiménez**, Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Nelly Bencomo. “[An Architectural Framework for Quality-driven Adaptive Continuous Experimentation](#)”. In: *Proceedings of the Joint 4th International Workshop on Rapid Continuous Software Engineering and 1st International Workshop on Data-Driven Decisions, Experimentation and Evolution (RCoSE/DDrEE)*. In press. IEEE, 2019, pp. 20–23.
- [W.4] **Miguel Jiménez**, Luis F. Rivera, Norha M. Villegas, Gabriel Tamura, Hausi A. Müller, and Pilar Gallego. “[DevOps’ Shift-Left in Practice: An Industrial Case of Application](#)”. In: *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Ed. by Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. Springer, 2019, pp. 205–220.
- [W.5] **Miguel A. Jiménez**, Ángela V. Gómez, Norha M. Villegas, Gabriel Tamura, and Laurence Duchien. “[A Framework for Automated and Composible Testing of Component-Based Services](#)”. In: *2014 IEEE 8th International Symposium on the Maintenance and Evolution of Service-Oriented and Cloud-Based Systems (MESOCA)*. 2014, pp. 1–10.

## Contributed Talks and Posters

- [P.1] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Towards Software Engineering at Run-time Through Continuous Experimentation and Evolution*. Poster at 2019 CRA Grad Cohort Workshop for Underrepresented Minorities + Persons with Disabilities (CRA URMD), Waikoloa Village, Hawaii, United States. Mar. 2019.
- [P.2] **Miguel Jiménez**, Gabriel Tamura, Hausi Müller, Joe Wigglesworth, and Ian Watts. *Model Transformation Issues for Round-trip Engineering of Deployment Specifications*. Poster at Joint Consortium for Software Engineering Research 2019 Spring Meeting (CSER) and 2<sup>nd</sup> Software Engineering for Machine Learning Applications (SEMLA), Montréal, Québec, Canada. May 2019.
- [P.3] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Continuous Deployment Specification for Large-Scale Systems*. Poster at the 28<sup>th</sup> Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, ON, Canada. Oct. 2018.
- [P.4] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, and Hausi Müller. *Round-trip Software Engineering in DevOps: Making the Infrastructure a Code Committer*. Poster at 2018 CRA Grad Cohort Workshop for Underrepresented Minorities + Persons with Disabilities (CRA URMD), San Diego, California, United States. Mar. 2018.
- [P.5] **Miguel Jiménez**, Norha M. Villegas, Gabriel Tamura, Hausi Müller, Joe Wigglesworth, and Ian Watts. *DevOps Round-trip Software Engineering: On Traceability from Dev to Ops and back*. Talk at the Consortium for Software Engineering Research (CSER), Markham, ON, Canada. May 2018.
- [P.6] **Miguel Jiménez**, Prashanti Angara, Harshit Jain, Kirti Agarwal, Roshni Jain, Hausi Müller, Ulrike Stege, and Joanna Ng. *Cognitive IoT Recipe Maven: Digital Expertise in the Kitchen*. Poster at Centre for Advanced Studies Technical Link Event (CASTLE), Markham, ON, Canada. May 2017.
- [P.7] **Miguel Jiménez**, Hausi Müller, and Gabriel Tamura. *A DSL Approach For Dynamic Performance Monitoring and Deployment*. Petcha Kutcha presentation at the Consortium for Software Engineering Research (CSER), Markham, ON, Canada. Oct. 2016.
- [P.8] **Miguel Jiménez**, Hausi Müller, and Gabriel Tamura. *A DSL Approach For Generating and Deploying Dynamic Performance Monitors for Self-Adaptive Software Systems*. Poster at the 26<sup>th</sup> Annual International Conference on Computer Science and Software Engineering (CASCON), Markham, ON, Canada. Oct. 2016.

## Invited Talks

- [T.1] **Miguel Jiménez**. *Continuous Value Delivery with DevOps (Spanish)*. Online webinar for university alumni, Universidad Icesi. Mar. 2019.
- [T.2] **Miguel Jiménez**, Gabriel Tamura, and Hausi Müller. *Towards Continuous Assurance of Non-Functional Requirements Through Continuous Experimentation*. Presentation at the [2<sup>nd</sup> Workshop on DevOps and Software Analytics for Continuous Engineering and Improvement](#), Annual International Conference on Computer Science and Software Engineering (CASCON). Markham, Canada. Nov. 2018.

## Research Experience

- Jan 2018 - **Graduate Research Assistant**  
Present IBM Advanced Studies + Rigi Research Group, University of Victoria, Canada  
*Advised by Dr. Hausi Müller, Dr. Gabriel Tamura and Joe Wigglesworth (IBM)*  
  
Conduct research and collaborate with the development team of IBM Cloud Automation Manager to develop round-trip engineering mechanisms for infrastructure as code, and automate continuous experimentation for deployments on the cloud.
- Jan 2014 - **Graduate Research Assistant**  
Aug 2016 i2T/DRISO Research Group, Universidad Icesi, Colombia  
*Advised by Dr. Gabriel Tamura*

- Identified challenges in dynamic performance monitoring of self-adaptive systems and proposed technical solutions following the SOA philosophy to advance the state of the art
- Designed and implemented two domain-specific languages for dynamic monitoring and distributed deployment
- Managed the computing resources of the i2T/DRISO research group's computing grid (15 physical machines)

Jun 2013 - **Research Assistant Intern**  
 Dec 2013 i2T/DRISO Research Group, Universidad Icesi, Colombia  
*Advised by Dr. Gabriel Tamura*

Implemented and conducted quantitative experiments for the matrix multiplication problem.

Spring 2012 **Undergraduate Research Assistant**  
 i2T/DRISO Research Group, Universidad Icesi, Colombia  
*Advised by Lorena Castaneda*

Learned about Service Component Architecture and migrated a MAPEK loop implementation from Apache Tuscany to FraSCaTi.

## Industry Experience

2015 **Freelance Software Developer**  
 Carvajal Espacios S.A.S., Cali, Colombia

Developed a web application for the purchasing department to manage raw material catalogues and suppliers, as well as material search statistics for supporting managerial level decision-making.

2015 **Freelance Software Developer**  
 Laboratorios LaFrancol S.A.S., Cali, Colombia

Developed a web application for the purchasing department to create online auctions and invite partner suppliers to bid.

2012 **Freelance Software Developer**  
 SQL Soluciones Informaticas S.A.S., Cali, Colombia

Developed an information system for a premier trolley service for ticket management, printing and selling.

2009-2010 **Software Developer**  
 SQL Soluciones Informaticas S.A.S., Cali, Colombia

- Deployed and managed the corporate website, customer support portal and online store
- Developed a content management site for video tutorials and small scripts for a tax software
- Designed advertisement for digital and print marketing campaigns

## Industry Collaborative Projects

2018 - **Reverse Engineering Deployment Specifications from Running Systems**  
 Present CAS Fellowship Project. IBM + University of Victoria, Canada

*Role: Lead Student*  
*Joe Wigglesworth (Lead Contributor), Hausi Müller (Principal Investigator)*

This project is concerned with the design of reverse engineering techniques to introspect deployed infrastructures and the generation of the representative deployment and configuration specifications. **I am currently working on** all the associated research and development activities.

2017 **Cognitive IoT Recipe Maven**  
 CAS Fellowship Project. IBM + University of Victoria, Canada

*Role: Lead Student*  
*Joanna Ng (Lead Contributor), Hausi Müller (Principal Investigator)*

This project aimed to develop software applications to exploit digital expertise in the modern kitchen based on integrated user, fridge and grocery store contexts. **I worked on** the design and development of a conversational agent for the smart kitchen, and an Android application for the management of dietary restrictions.

2015 - **Context-Driven Route Optimization: A Home-Health Case**  
 2016 Technological Innovation Project. Colciencias + Carvajal T&S, Colombia

*Role: Young Researcher*  
*Diana Gonzalez and Oscar Mancipe (Lead Contributors), Gabriel Tamura (Principal Investigator)*

This project aimed to optimize the route planning of a management software for home health. **I worked on** a test case generator for an adaptation to the asymmetric traveling salesman problem with time windows. Moreover, I contributed to the research and development activities related to online maps.

2014 - **Processing of Large and Complex XML Documents**  
 2015 Technological Innovation Project. Colciencias + Carvajal T&S, Colombia

*Role: Young Researcher*  
*Pilar Gallego (Lead Contributor), Gabriel Tamura (Principal Investigator)*

This project aimed to improve a reference architecture of a product family for the processing of large data volumes. **I worked on** automating the monitoring, configuration and deployment of controlled architectural experiments.

## Teaching and Mentoring Experience

2016-2018 **Lead Graduate Teaching Assistant**  
 Fundamentals of Programming with Engineering Applications (CSC 111), University of Victoria  
 Instructor: Dr. Hausi Müller

- Lectured weekly labs and assisted students with programming and lab assignments
- Co-led weekly meetings and developed teaching material and quizzes
- Developed [grade-buddy](#), a program to assist teaching assistants and professors in automating the marking of programming assignments
- Developed a [multi-platform installation assistant](#) to ease the installation of CLion and its dependencies on Windows, Mac and Linux
- Developed [examgen](#), a program to generate examinations along with their solutions from a YAML input file. The resulting files are rendered to either  $\text{\LaTeX}$  or Moodle. By creating examgen, we stopped printing **2800** quizzes and reduced marking time by **30h** per term
- Deployed and managed an online platform to host and mark programming assignments

Spring 2018 **Graduate Teaching Assistant**  
 Assistance Centre in Computer Science, University of Victoria

Tutored students and assisted them with programming assignments in one-on-one sessions.

Fall 2016 **Graduate Teaching Assistant**  
 Data Structures I (CSC 225), University of Victoria  
 Instructor: Dr. Ulrike Stege

Lectured weekly labs, developed scripts to automate marking and graded assignments.

2015 **Technical Advisor**  
 Undergraduate degree project, Interactive Media Design Program - Universidad Icesi

Project: Knowledge management and dissemination: alternative soccer culture  
 Student: Juan David Flórez Bautista

2014 **Undergraduate Degree Project Supervisor**  
 Undergraduate degree project, Interactive Media Design Program - Universidad Icesi

Project: Folii: natural and interactive encyclopedia mediated by citizen science  
 Students: Juan Pablo Pérez, Mauricio Alberto Toro

- 2014      ***Undergraduate Degree Project Co-Supervisor***  
Undergraduate degree project, Interactive Media Design Program - Universidad Icesi  
Project: An information system for bicycle transportation  
Student: Claudia Ximena Barriga
- Spring 2011      ***Undergraduate Teaching Assistant***  
Data Structures and Algorithms, Universidad Icesi  
Instructor: Angela Villota-Gomez  
Graded assignments and assisted students during weekly labs.

## Skills

The following is a list of selected skills.

### ■ Technical Skills

Architecture Design  
Containerized Applications  
Continuous Delivery  
Data mining (basic)  
Infrastructure Provision  
Infrastructure as Code  
Language Engineering  
Object Oriented Programming  
Performance Monitoring  
Service Component Architecture  
Software Deployment  
Web programming

### ■ Programming Languages

Java, Xtend  
JavaScript, CSS, HTML  
C  
Python  
Go  
C#  
Oz  
ShellScript

## Service and Volunteering

- 2011-2012      ***Volunteer instructor for the Web Programming Club***  
Universidad Icesi, Cali, Colombia  
Developed teaching material and lectured students of the Systems Engineering and Interactive Media Design programs on HTML, CSS and JavaScript.

## References

**Dr. Hausi Müller** ([hausi@uvic.ca](mailto:hausi@uvic.ca))

Associate Professor and Dean of Research  
Department of Computer Science, University of Victoria

**Dr. Gabriel Tamura** ([gtamura@icesi.edu.co](mailto:gtamura@icesi.edu.co))

Associate Professor  
Department of ICT, Universidad Icesi

**Dr. Lorena Castaneda** ([lcastane@gmail.com](mailto:lcastane@gmail.com))

Software Developer  
CityView

**Dr. Norha M. Villegas** ([nvillega@icesi.edu.co](mailto:nvillega@icesi.edu.co))

Director of the Software Systems Engineering Professional Program  
Department of ICT, Universidad Icesi